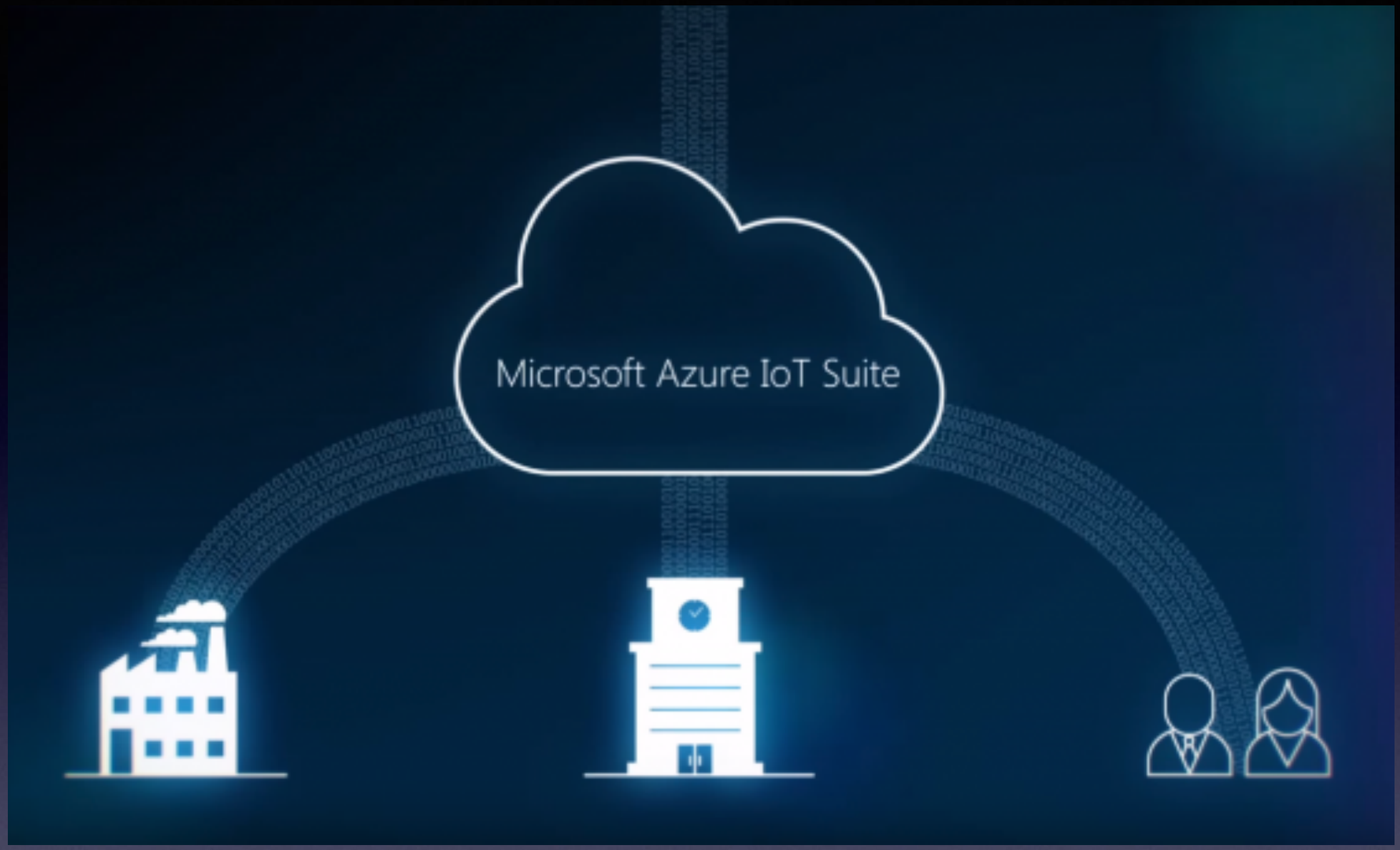
How to talk to millions of IoT devices without pulling out your hair!

Harold Pulcher
pulcher@pulcher.biz

Become a Windows Insider!

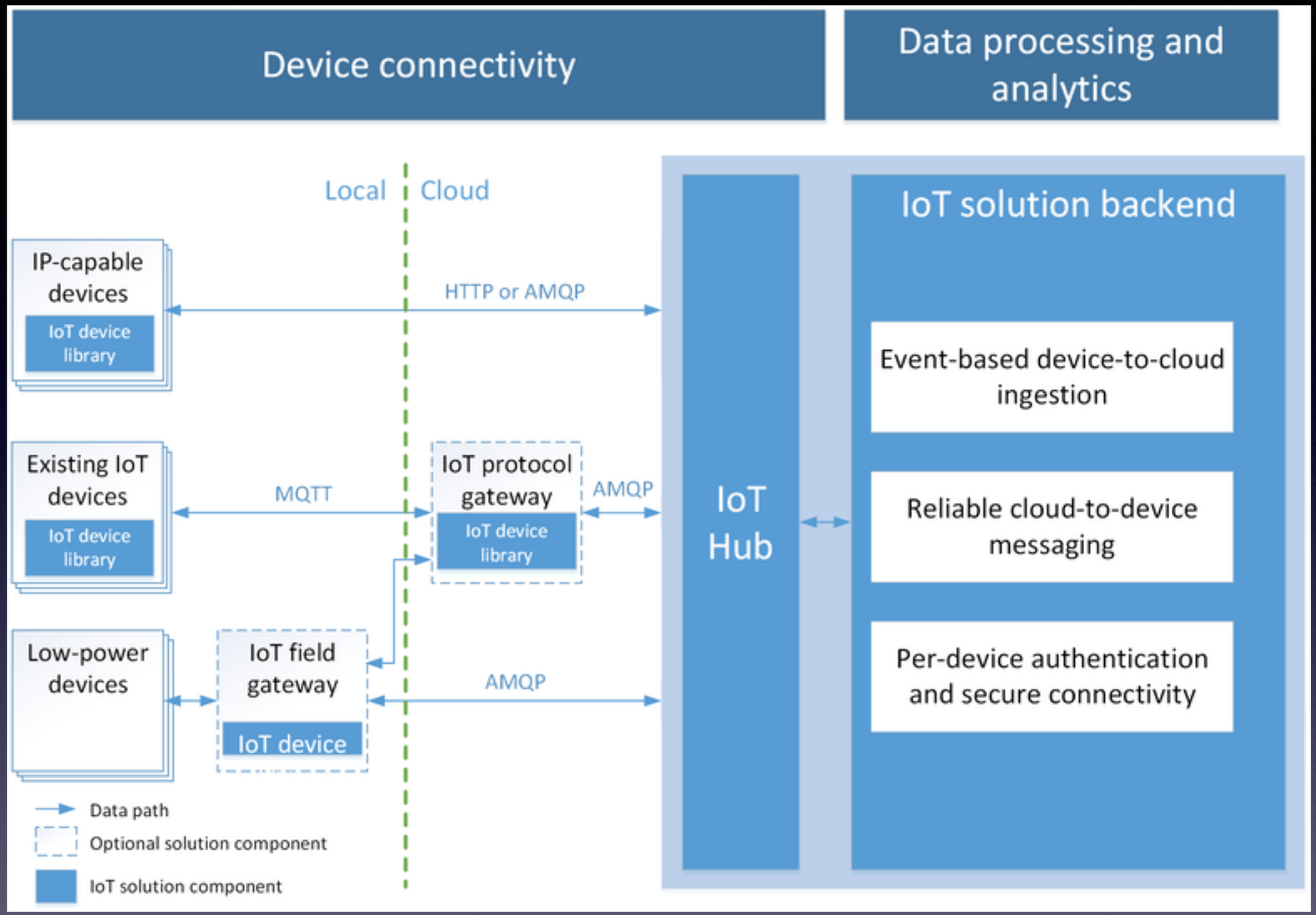
https://insider.windows.com/



A fully managed service that enables reliable and secure bidirectional communications between millions of IoT

Device Challenges

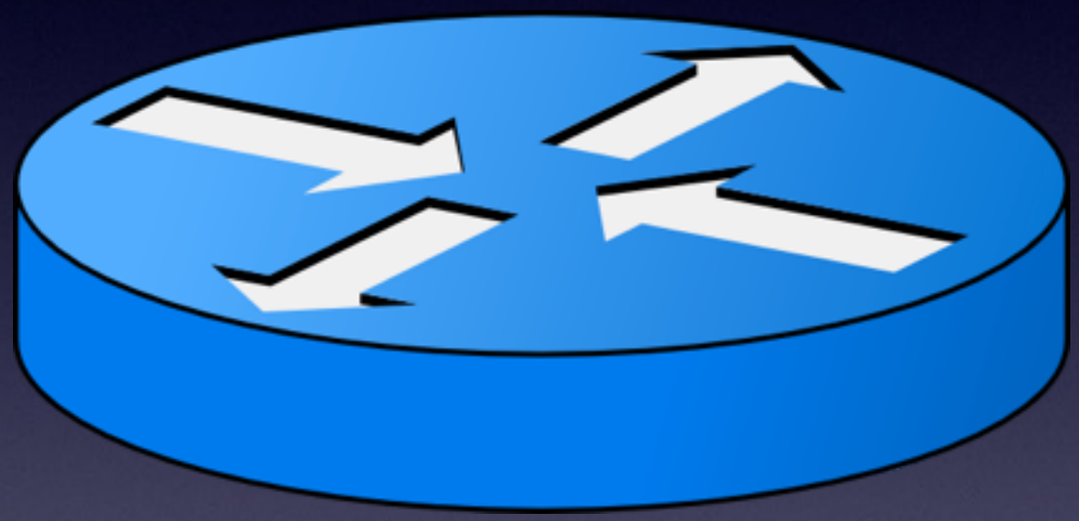
- Are often embedded systems with no human operator.
- Can be in remote locations, where physical access is very expensive.
- May only be reachable through the solution back end.
- May have limited power and processing resources.
- May have intermittent, slow, or expensive network connectivity.
- May need to use proprietary, custom, or industry-specific application protocols.
- Can be created using a large set of popular hardware and software platforms.



What is this hub thing?

So how do these things connect again?

- AMQP
- MQTT
- HTTPS



What is this “Telemetry” thing people are talking about?

But are these things secure?

This looks familiar?

IoT Hub

- Provides device-to-cloud event ingress and cloud-to-device messaging.
- Provides per-device identity and revocable access control.
- Provides device SDKs for a large variety of platforms and languages.

Event Hub

- Only provides event ingress.
- Required to implement a custom solution to support per-device credentials and anti-spoofing measures.
- Is supported on .NET, and C. Not UWP support.

Can I use just any old OS?

- Linux: Debian, Fedora, Raspbian, Ubuntu, Yocto
- Windows: Desktop, IoT Core, Server, Embedded Compact
- mbed OS
- TI-RTOS

Can I use just any old language on any device?

- C#
- Java
- Javascript
- C <- The sexy isn't dead yet!

- Beaglebone
- Minnowboard Max
- Intel Edison
- Raspberry Pi 2
- Freescale FRDM K64
- TI CC3200
- Arrow DragonBoard
- Your Computer

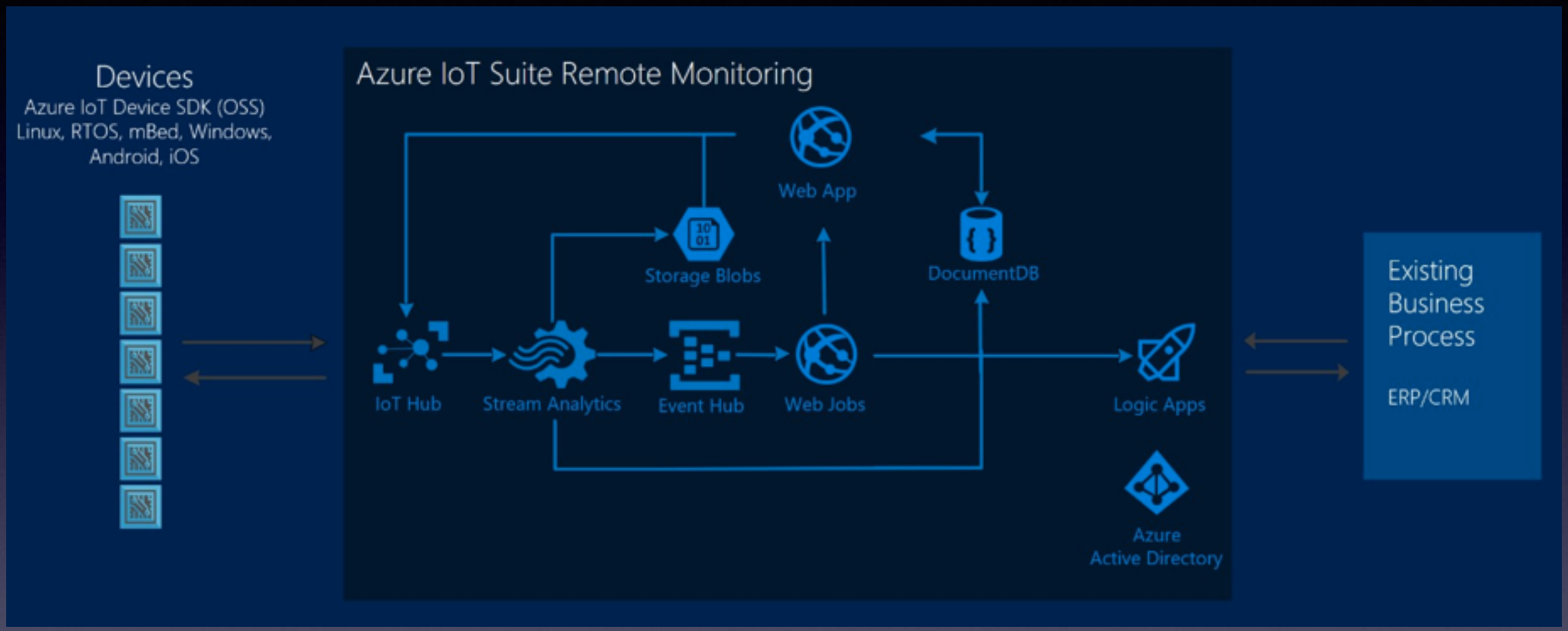
https://azure.microsoft.com/en-us/develop/iot/get-started/

Is this gonna bankrupt me?

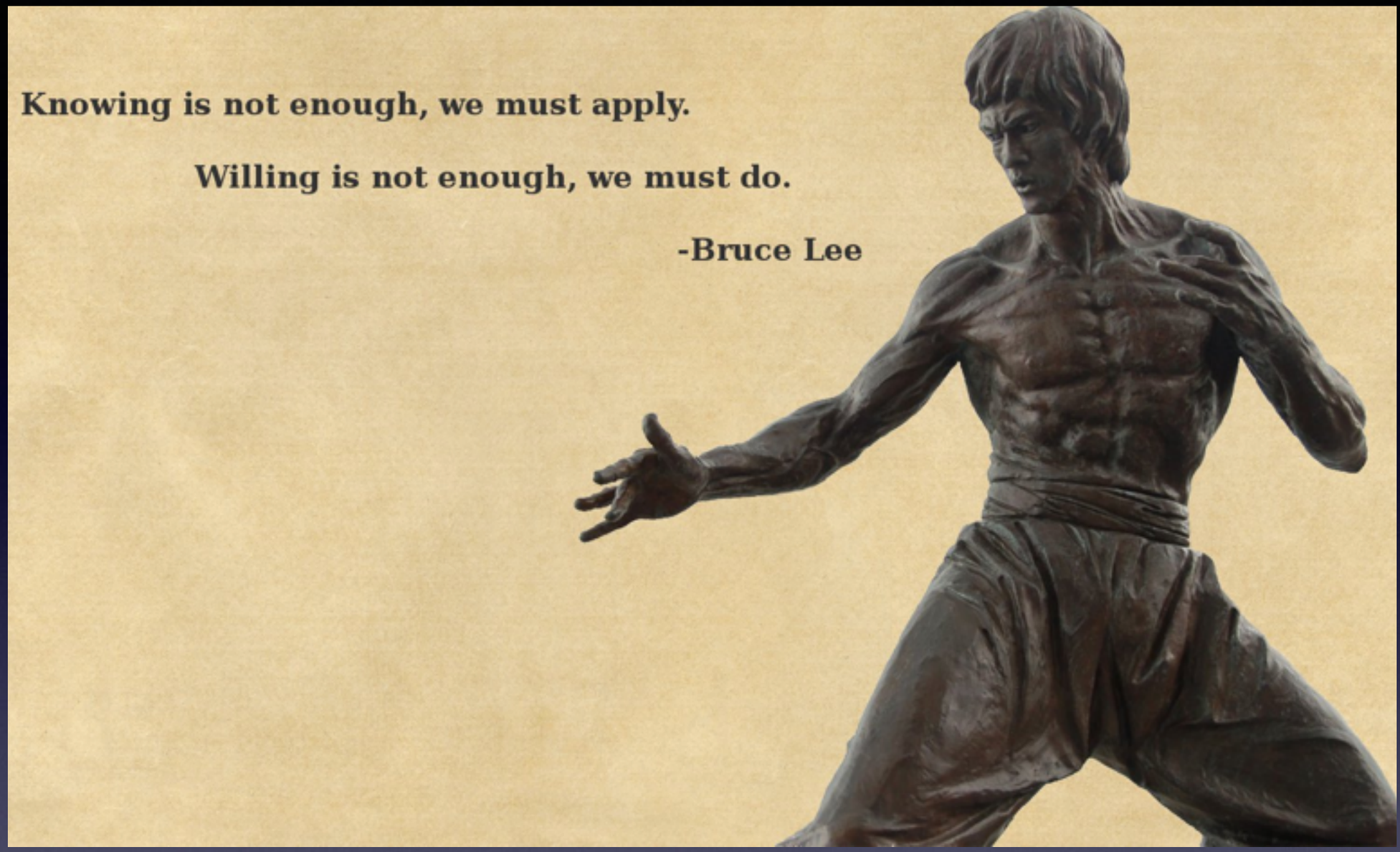
EDITION TYPE	PRICE (PER MONTH)	TOTAL NUMBER OF MESSAGES/DAY	MESSAGE METER SIZE
Free	Free	8,000	0.5 KB
S1	$25	400,000	4 KB
S2	$250	6,000,000	4 KB

How much can I really use?

Throttle	Per-hub value
Identity registry operations (create, retrieve, list, update, delete), individual or bulk import/export	100/min/unit, up to 5000/min
Device connections	100/sec/unit
Device-to-cloud sends	120/sec/unit (for S2), 12/sec/unit (for S1). Minimum of 100/sec.
Cloud-to-device operations (sends, receive, feedback)	100/min/unit



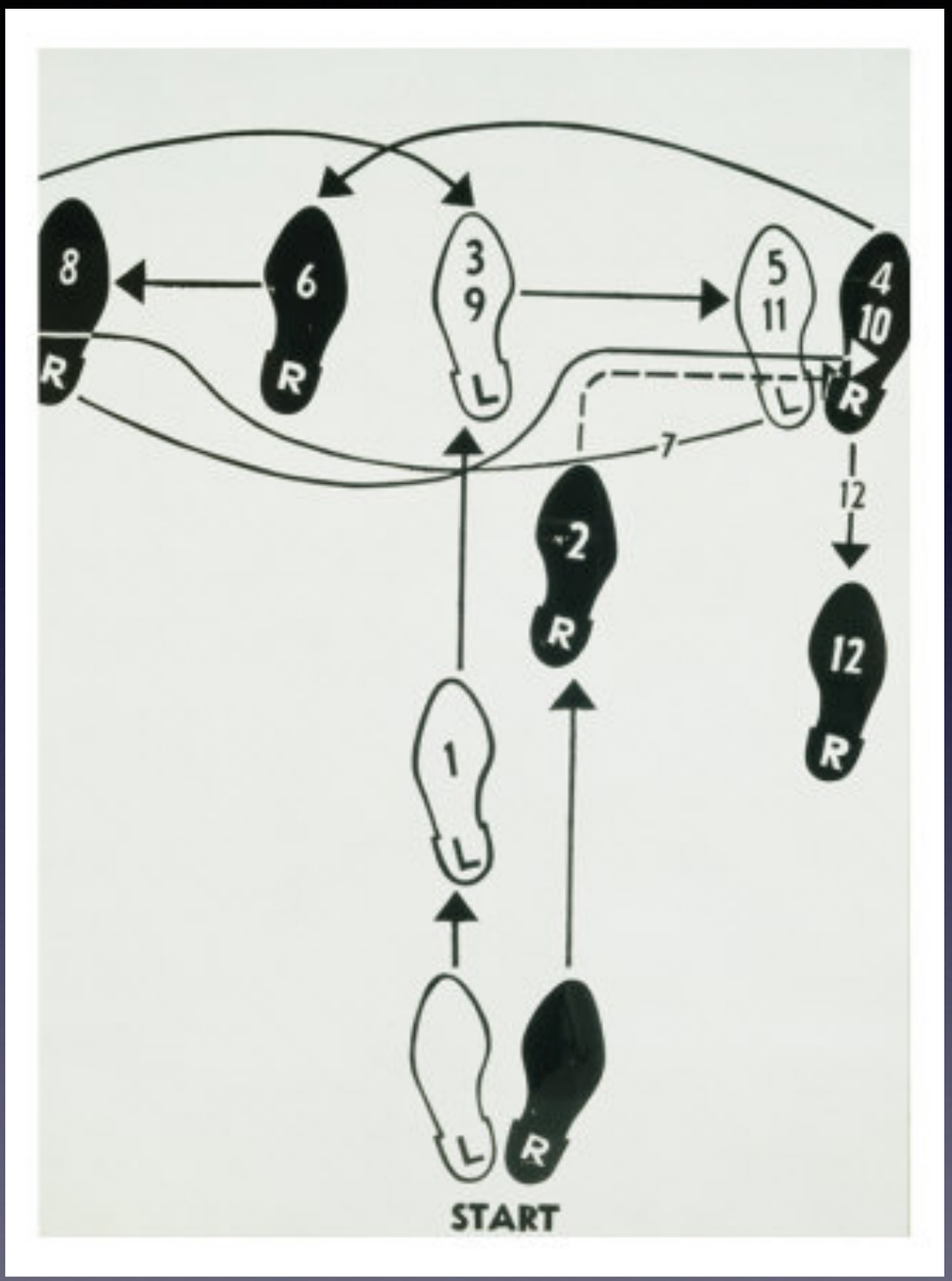
So what can I do with stuff?



Enough! Show the goods!

Basic Steps

1. Get an Azure account
2. Setup an IoT hub
3. Grab some credentials
4. Code up a sender, a receiver, and a device if you have it.



Links

- Main site: https://azure.microsoft.com/en-us/services/iot-hub/
- Dev Guide: https://azure.microsoft.com/en-us/documentation/articles/iot-hub-devguide/
- Azure Fridays: https://azure.microsoft.com/en-us/documentation/videos/azure-friday/
- Elio Damaggio's video: https://azure.microsoft.com/en-us/documentation/videos/azurecon-2015-overview-of-azure-iot-hub/
- Oliver Bloch's AzureCon video: https://azure.microsoft.com/en-us/documentation/videos/azurecon-2015-connect-your-iot-devices-with-azure-iot-client-libraries/
- Fez Hat: https://www.ghielectronics.com/catalog/product/500

- Device Explorer: https://github.com/Azure/azure-iot-sdks/blob/master/tools/DeviceExplorer/doc/how_to_use_device_explorer.md
- My examples and slides: https://github.com/pulcher/AzurePlay